Fraction Strip Subtraction

Reporting Category Computation and Estimation
Topic Subtracting fractions from a whole unit

Materials

- Sets of Fraction Strips (attached)
- Fraction Cards (attached)

Vocabulary

fraction, mixed number, improper fraction, like denominators, unlike denominators, estimation, simplify, simplest form, factor, least common denominator, common factors, common multiples, greatest common factor (GCF), least common multiple (LCM), subtract, difference

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
Note: Before undertaking this activity, make a complete set of fraction strips—one strip each for 1 whole (1 unit), 2 halves, 3 thirds, 4 fourths, and so forth—for each student. Copy each sheet of the attached fraction strips on a different color of cardstock and cut out the strips. Since each strip is the same length, they can be overlapped and/or folded to work problems and will probably be easier to use in complete-strip format. If a student has difficulty understanding overlapping, the strips may be cut apart. Also, create a set of attached fraction cards for each group. This activity can also be done quite easily with fraction squares or circles, egg cartons, or other fraction manipulatives.

1. Give each student a complete set of fraction strips. Hold up the unit (1) strip and ask, "What does this represent?" (one unit or one whole) Ask, "How many fourths make up this unit? (4) Pose the problem, "Place the unit and the four fourths fraction strips in front of you. If this unit (1 whole) represents a candy bar and I give $\frac{1}{4}$ of it to Sue, how much of the candy bar remains?" ($\frac{3}{4}$) Continue, "If I give an additional $\frac{3}{8}$ of the candy bar to Joe, how much of the original candy bar will be left for me?" Encourage students to explore with the one-eighth strips to discover the answer. ($\frac{3}{8}$) Continue with more examples, allowing sufficient time for students to explain their reasoning.
2. Once students understand the process of using fraction strips to subtract a fraction from a whole unit, group students into pairs or small groups to play the "Take One" game. Give each group a set of the attached fraction cards (or other fraction cards). Model the game

for the class, using fraction strips. Start with the unit strip, subtract $\frac{1}{3}$ from it, and ask for the result. Then, subtract $\frac{1}{4}$ from that result, using twelfths pieces. Answer any questions that arise. Make sure to give students ample time to explore and make some discoveries for themselves before telling them how to play the "Take One" game, as follows:

- Players begin with the whole unit strip or the 2-halves strip.
- Player 1 draws a fraction card from the pile and subtracts the amount shown from the whole or 2 halves, keeping track of what is left with the fraction strips. Substitute equivalent fractions as needed.
- Players alternate turns, with each player drawing a card, subtracting, and keeping track of what is left.
- The first player with a blank board wins.

3. Ask the pairs of students to place in front of them fraction strips to represent $\frac{7}{8}$ and $\frac{1}{2}$. Ask, "Which is bigger?" ($\frac{7}{8}$) Ask them, "How much bigger?" Following their previous work with addition of strips, pairs should overlap the two fraction strips, the halves strip on top of the eighths strip, and find the difference $\frac{3}{8}$. Call on volunteers to model their work. If necessary, model the problem for the students.
4. Ask the groups to model the following problems, one at a time, and record their models by drawing on paper. Ask students also to write the fractions next to the representation of each problem. Students need to connect the model with the written problem. Have them demonstrate and explain correct solutions to the class. Students can also create problem situations for these number sentences.

   a. $\frac{2}{3} - \frac{1}{9} =$ ____ b. $\frac{3}{4} - \frac{5}{8} =$ ____

   c. $\frac{10}{12} - \frac{3}{6} =$ ____ d. $\frac{4}{5} - \frac{4}{10} =$ ____

   e. $\frac{1}{2} - \frac{1}{6} =$ ____

5. Ask each student to model a solution to the following problem, record a diagram or picture of their model, and write an explanation of their solution: "Brad has $\frac{3}{4}$ of a pound of fudge, and Julie has $\frac{7}{8}$ of a pound. Together, do they have enough fudge to serve 12 people $\frac{1}{8}$ of a pound of fudge each?" Solutions will vary, but all students should come to understand that Brad and Julie have a total of $\frac{13}{8}$ pounds of fudge—i.e., enough to serve 13 people $\frac{1}{8}$ of a pound each. Allow students who find writing an explanation difficult to explain orally.

Assessment

- **Questions**
  - How is subtracting fractions with manipulatives different from adding fractions with manipulatives?
  - Why is it so important to define the whole before solving a subtraction problem?
- **Journal/Writing Prompts**
  - Use one of the problems you solved, and create a problem situation to reflect the subtraction of the fractions. Include drawings.
  - Draw a picture and explain the solution to the following question: Brad has $\frac{2}{3}$ of a pan of brownies at home. When he came home from school, he ate $\frac{1}{2}$ of the brownies in the pan. What fraction of the whole pan of brownies is left?

Fraction Cards

$\frac{1}{5}$	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{2}{5}$
$\frac{3}{8}$	$\frac{1}{8}$	$\frac{3}{10}$	$\frac{1}{2}$	$\frac{7}{8}$
$\frac{7}{10}$	$\frac{1}{10}$	$\frac{3}{8}$	$\frac{9}{10}$	$\frac{3}{2}$
$\frac{5}{3}$	1	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{5}{8}$
$\frac{4}{3}$	$\frac{7}{5}$	$\frac{3}{5}$	$\frac{5}{4}$	$\frac{7}{4}$

Fraction Strips — One Whole (One Unit)

1
1
1
1
1

Fraction Strips — Halves

$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{1}{2}$

Fraction Strips — Fourths

$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

Fraction Strips — Eighths

$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

Fraction Strips — Tenths

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

Fraction Strips — Thirds

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

Fraction Strips — Sixths

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Fraction Strips — Twelfths

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$